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## MEMORANDUM

**TO:** Steve Renninger, USEPA

**REF. NO.:** 038443-62-03

**FROM:** Adam Loney/Valerie Chan, CRA

**DATE:** February 20, 2014

**RE:** Bullseye Amusements, Building 14, 2003 Dryden Road

Conestoga-Rovers & Associates (CRA) has prepared this memorandum to document the available data for benzene concentrations in indoor air and sub-slab soil vapor at Bullseye Amusements (Building 14), located at 2003 Dryden Road. CRA prepared this memorandum in response to a request from the United States Environmental Protection Agency (USEPA) during the February 13, 2014 conference call to discuss the status of vapor intrusion mitigation activities for the South Dayton Dump & Landfill Site (Site). CRA is submitting this memorandum on behalf of the Respondents to the Administrative Settlement Agreement and Order on Consent (ASAOC) for Remedial Investigation/Feasibility Study (RI/FS) of the Site, Docket No. V-W-06-C-852 (Respondents).

The USEPA requested the summary of benzene data for Building 14 following the detection of benzene in indoor air samples at concentrations greater than the Ohio Department of Health (ODH) Screening Level of 2 parts per billion (ppb). With the exception of one sample, benzene concentrations in sub-slab samples have been well below the ODH sub-slab screening level of 20 ppb. All indoor air and sub-slab benzene results have been below the ODH action levels for benzene. A summary of the analytical results including sampling dates and locations is provided in Table 1 (the sub-slab depressurization system (SSDS) commenced operation on December 20, 2013).

**Table 1. Building 14 (Bullseye Amusements) Concentrations (ppb)**

Parameter	Location	January 2012	March 2012	August 2012	January 2014	ODH Screening Level	ODH Action Level
Benzene	IA-14-A	--	0.58	<b>2.4</b>	<b>3.2</b>	2	20
	IA-14-B	--	0.67	<b>2.1</b>	<b>2.1</b>		
	IA-14-C	--	0.60	2.0	1.8		
	SS-14-A	1.9 J / 1.8 J	6.0 J	<b>50</b>	0.44	20	200
	SS-14-C	0.072 U	0.056 U	0.056 U	1.3		

**Notes:**

J - Estimated.

U - Non-detect at associated value.

Bolded values exceed ODH Screening Level

CRA completed a building Physical Survey Questionnaire for Building 14 in January 2011. Building 14 is a single-story, commercial-use, concrete slab-on-grade, building consisting of offices in the front and a shop/warehouse area in the rear, constructed prior to 1959. The building footprint is 2,886 square feet (ft<sup>2</sup>), excluding a shed attached to the rear of the shop. The shop/warehouse area is not insulated, there is little if any insulation in the office area, and the windows are inoperable and vapor sealed with plastic. The building floor slab is dry and contains numerous cracks. The foundation walls are sealed with an unknown grey paint or sealer. Heavy floor staining is present around the former grease filter cleaning exhaust area and incidental spills and splashes might have occurred during normal

operations. Exterior openings include vents, utility pipe penetrations and windows in the office section of the building. Building 14 contains a forced air furnace and central air conditioning.

On February 24, 2012 a representative of CRA completed an indoor air building assessment of Building 14, which was previously occupied by A-Evans Air Filter Service and is currently occupied by Bullseye Amusements. CRA observed a number of factors that may influence indoor air quality and contribute to concentrations of benzene within the building. These factors included, but are not limited to, (i) personnel smoking tobacco products within the building (ii) the storage of a petroleum-fueled truck inside the building (iii) the use of chemical-containing products including spray adhesives, herbicides, and cleaning products.

Vapor intrusion (VI) sampling conducted at Building 14 in January and March of 2012, at sampling points SS-14-A, SS-14-B, and SS-14-C showed benzene concentrations in indoor air and sub-slab soil vapor were less than the ODH screening levels. The August 2012 VI sampling results showed an increase in benzene concentrations to levels greater than the ODH screening levels in indoor air at sampling points IA-14-A and IA-14-B and sub-slab soil vapor at sub-slab probe SS-14-A.

CRA completed installation and commenced operation of the SSDS at Building 14 on December 20, 2013. A summary of vacuum readings from Building 14 is provided in Table 2. Vacuum readings at sub-slab probes SS-14-A, SS-14-B, and SS-14-C were greater than the acceptable limit of 0.004 inches of water column (" w.c.) in the two monitoring events conducted after the installation of the SSDS. Extraction probe one (EP-1) and EP-2 had post-SSDS vacuum readings of -1.25 to -1.50" w.c. and -2.75" w.c. respectively, which are typical of what was specified in the work plan.

Table 2. Building 14 (Bullseye Amusements) Vacuum Readings (inches water column)			
Sample Location	12/05/2013	01/07/14	01/24/14
SS-14-A	-0.0075	-0.00723	-0.006
SS-14-B	-0.0382	-0.0279	-0.0237
SS-14-C	0.00106	-0.5300	-0.575
EP-1	-1.25	-1.25	-1.50
EP-2	--	-2.75	-2.75

Post SSDS proficiency sampling conducted in January 2014 showed that benzene concentrations in sub-slab soil vapor samples were below the ODH screening level of 20 ppb, while benzene concentrations measured in indoor air were similar to those reported during the August 2012 VI sampling event (i.e., 2 to 3 ppb). This indicates the benzene concentrations in indoor air were not a result of vapor intrusion from sub-slab soil vapor into Building 14 as concentrations in the indoor air were greater than those in the sub-slab soil vapor.

The SSDS in Building 14 began operation in December of 2013. The sampling complete in January 2014 showed that the sub-slab benzene concentrations at sub-slab probe SS-14-A have decreased from the potentially anomalous concentration of 50 ppb to 0.44 ppb, consistent with other previous results. Continued operation of the SSDS should keep sub-slab concentrations below the ODH screening levels. However, indoor air benzene concentrations remained at or above ODH screening levels, even after the startup of the SSDS, indicating that a source within the building is likely causing or contributing to the indoor air concentrations. All indoor air and sub-slab benzene results have been consistently below the ODH action levels for benzene. The available evidence suggest that indoor air benzene concentrations detected during VI Sampling in August 2012, and during hybrid proficiency sampling in January 2014 are a result of ongoing daily human activities within and around Building 14 and are not the result of a complete VI pathway.